MONTHLY WEATHER REVIEW.

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The MONTHLY WEATHER REVIEW is based on data from about 3500 land stations and many ocean reports from vessels taking the international simultaneous observation at Greenwich noon.

Special acknowledgment is made of the data furnished by the kindness of cooperative observers, and by Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt I. S. Kimball, General Superintendent of the United States Life-Saving Service; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; W. N. Shaw, Esq., Secretary, Meteorological Office, London; H. H. Cousins, Chemist, in charge of the Jamaica Weather Office; Señor Anastasio Alfaro, Director of the National Observatory, San José, Costa Rica; Rev. L. Gangoiti, Director of the Meteorological Observatory of Belen College, Havana, Cuba.

As far as practicable the time of the seventy-fifth meridian, which is exactly five hours behind Greenwich time, is used in the text of the MONTHLY WEATHER REVIEW.

Barometric pressures, both at land stations and on ocean vessels, whether station pressures or sea-level pressures, are reduced, or assumed to be reduced, to standard gravity, as well as corrected for all instrumental peculiarities, so that they express pressure in the standard international system of measures, namely, by the height of an equivalent column of mercury at 32° Fahrenheit, under the standard force, i. e., apparent gravity at sea level and latitude 45°.

SPECIAL ARTICLES, NOTES, AND EXTRACTS.

PRESENT DAY CLIMATES IN THEIR TIME RELATION.

By FRANK MORRIS BALL, Department of Geology, University of Minnesota. Dated Minneapolis, Minn., April 10, 1906.

It is often asserted by people who have lived in a locality for many years that the climate of their region has undergone marked changes during their residence, the most common statements being that cold weather came earlier in the fall, that greater snowfall was experienced, that the thermometer registered more continuously low temperatures in years past than at present, and that the rainfall is increasing or decreasing in amount. In the light of the modern science of statistics these statements are open to serious question. The human organism is at best an inaccurate register of temperature, and memory is more liable to be impressed with some single manifestation of weather than with the average of weather conditions which go to make up climate. A vivid impression of a day on which the thermometer registered 40° below zero is quite likely to remain in the mind for a long time, but the week of moderately cold weather which followed the cold snap and which, when averaged with the lowest temperature noted, made only average winter weather, is quite likely to be unnoticed, or, if noted at all, soon forgotten.

The introduction of instruments for the measurement of weather conditions, and the registration of all temperature changes according to an absolute instead of a relative standard show conclusively that when a long period of years is considered climatic averages are essentially stable.

The accompanying tables illustrate this stability of climate at places widely separated and subject to the control of different climatic factors.

Tables 1 and 2 show the annual temperatures and rainfall for neighboring localities in Minnesota.

Hann's Handbook of Climatology quotes the computations of Angot on the dates of vintage in France since the fourteenth century. Table 3 shows an oscillation but no permanent change in climatic conditions during this long period.

Tables 4 and 5, given by Russell in his book on meteorology, show temperature averages for St. Petersburg, Russia, and Philadelphia, Pa.

When long periods of years are considered, an oscillation of climate seems to be apparent. Thus for North America an 11-year oscillation has been computed, corresponding to the sun-spot cycle. This variation has not been shown to be persistent or general in occurrence. In Europe a 36-year period of oscillation of both rainfall and temperature is found by Brückner to occur. These variations are always slight, however, and do not as a rule exceed 0.5° to 1° on either side of the established mean.

TABLE 1.—*Average temperature compiled from records kept at Fort Snelling and St. Paul, Minn., since 1822.*

[From C. W. Hall's Geography of Minnesota.]

Years.	°F.
1822–1824	43.33
1825–1829	46.00
1830–1834	46.00
1835–1839	43.60
1840–1844	42.00
1845–1849	43.60
1850–1854	44.40
1855–1859	41.00
1860–1864	42.80
1865–1869	41.80
1870–1874	42.80
1875–1879	42.80
1880–1884	43.40
1885–1889	42.20
1890–1894	43.00
1895–1899	43 00
1900–1901	44.60
1822–1849	44.09
1850–1877	42.60
1878–1901	43.16

TABLE 2.—*Annual rainfall at Minneapolis, Minn., since 1866.*

[Compiled by C. W. Hall from the records of William Cheney.]

Years.	Inches.
1866–1871	32.29
1872–1881	27.83
1882–1891	27.09
1892–1901	29.55
Average, 1866–1901	28.85

The accompanying tables show that no permanent changes of temperature were experienced at the places quoted during the periods of time recorded. It would be beyond the power of actual demonstration to say that the figures prove an abso-